Claims

[c1]   1. A system for performing automated predictive reliability on a complex system having a plurality of subsystems and a plurality of components within each subsystem, comprising:

a data acquisition component that acquires service data for the plurality of components of at least one of the plurality of subsystems and determines age information and failure information from the service data for each of the plurality of components;

a statistical analysis component that generates a statistical model according to the age information and failure information; and

a simulation component that predicts future failures for the life cycle of the plurality of components according to the statistical model.

[c2]   2. The system according to claim 1, wherein the statistical model comprises a Weibull distribution model.

[c3]   3. The system according to claim 2, wherein the simulation component determines a plurality of statistics for the predicted future failures.

[c4]   4. The system according to claim 1, further comprising a report generation component that compiles results produced from the simulation component .

[c5]   5. The system according to claim 1, further comprising an alert generation component that generates alerts for the predicted future failures.

[c6]

6. A system for performing automated predictive reliability on a complex system having a plurality of subsystems and a plurality of components within each subsystem, comprising:

means for acquiring service data for the plurality of components of at least one of the plurality of subsystems;

means for determining age information and failure information from the service data for the plurality of components;

means for generating a statistical model that approximates the failure information to the age information; and

means for predicting future failures for the life cycle of the plurality of components according to the statistical model.

[c7]   7. The system according to claim 6, further comprising means for compiling the predicted future failures into a report.

[c8]   8. The system according to claim 6, further comprising means for issuing alerts for the predicted future failures.

[c9]   9. A system performing automated predictive reliability on a complex system having a plurality of subsystems and a plurality of components within each subsystem, comprising:
at least one data repository containing a plurality of service data for the plurality of subsystems and components;
a predictive reliability system that predicts the reliability for the plurality of components of at least one of the plurality of subsystems according to the plurality of service data, the predictive reliability system comprising a data acquisition component that acquires the plurality of service data from the at least one data repository and determines age information and failure information from the service data for each of the plurality of components; a statistical analysis component that generates a statistical model according to the age information and failure information; and a simulation component that predicts future failures for the life cycle of the plurality of components according to the statistical model; and
a first computing unit configured to serve the at least one data repository and the predictive reliability system.

[c10]   10. The system according to claim 9, wherein the at least one data repository stores historical failure data for the complex system.

[c11]   11. The system according to claim 9, wherein the at least one data repository stores analysis data for the complex system including data for subsystems and components that form the complex system.

[c12]   12. The system according to claim 9, wherein the statistical model comprises a

Weibull distribution model.

[c13]   13. The system according to claim 9, wherein the predictive reliability system further comprises a report generation component that compiles results produced from the simulation component.

[c14]   14. The system according to claim 9, wherein the predictive reliability system further comprises an alert generation component that generates alerts for failures and incipient failures for the complex system from the predicted reliability.

[c15]   15. The system according to claim 14, wherein the alert generation component notifies users connected to the first computing unit over a network.

[c16]   16. The system according to claim 9, further comprising a second computing unit configured to interact with the at least one data repository and the predictive reliability system served from the first computing unit over a network.

[c17]   17. The system according to claim 9, further comprising an on-demand analyzer that enables a user to perform ad hoc analysis on the complex system.

[c18]   18. The system according to claim 9, wherein the at least one data repository stores corrective actions for servicing any predicted problems.

[c19]   19. The system according to claim 18, wherein the predictive reliability system provides a candidate set of corrective actions for servicing any predicted problems.

[c20]   20. A method performing automated predictive reliability on a complex system having a plurality of subsystems and a plurality of components within each subsystem, comprising:
acquiring service data for the plurality of components of at least one of the plurality of subsystems;
determining age information and failure information from the service data for the plurality of components;
generating a statistical model according to the age information and failure

information; and

predicting future failures for the life cycle of the plurality of components according to the statistical model.

[c21]   21. The method according to claim 20, further comprising compiling the predicted future failures into a report.

[c22]   22. The method according to claim 20, further comprising issuing alerts for the predicted future failures.

[c23]   23. The method according to claim 20, wherein the statistical model comprises a Weibull distribution model.

[c24]   24. A method performing predictive reliability on a complex system having a plurality of subsystems and a plurality of components within each subsystem, comprising:

prompting a user to select a plurality of components of at least one of the plurality of subsystems;

in response to the user selection, acquiring service data for the selected plurality of components;

determining age information and failure information from the service data for the selected plurality of components;

generating a statistical model according to the age information and failure information; and

predicting future failures for the life cycle of the plurality of components according to the statistical model.

[c25]   25. The method according to claim 24, further comprising compiling the predicted future failures into a report.

[c26]   26. The method according to claim 25, further comprising generating the report to the user.

[c27]   27. The method according to claim 24, further comprising issuing alerts to the user for the predicted future failures.

[c28]   28. The method according to claim 24, further comprising prompting the user to select additional subsystems and components to analyze.

[c29]   29. A computer-readable medium storing computer instructions for instructing a computer system to perform automated predictive reliability on a complex system having a plurality of subsystems and a plurality of components within each subsystem, the computer instructions comprising:
acquiring service data for the plurality of components of at least one of the plurality of subsystems;
determining age information and failure information from the service data for the plurality of components;
generating a statistical model according to the age information and failure information; and
predicting future failures for the life cycle of the plurality of components according to the statistical model.

[c30]   30. The computer-readable medium according to claim 29, further comprising instructions for compiling the predicted future failures into a report.

[c31]   31. The computer-readable medium according to claim 29, further comprising instructions for issuing alerts for the predicted future failures.

[c32]   32. The computer-readable medium according to claim 29, wherein the statistical model comprises a Weibull distribution model.

[c33]   33. The computer-readable medium according to claim 29, further comprising instructions for determining a plurality of statistics for the predicted future failures.

[c34]   34. A computer-readable medium storing computer instructions for instructing a computer system to perform automated predictive reliability on a complex system having a plurality of subsystems and a plurality of components within each subsystem, the computer instructions comprising:
prompting a user to select a plurality of components of at least one of the plurality of subsystems;

acquiring service data for the selected plurality of components;

determining age information and failure information from the service data for the selected plurality of components;

generating a statistical model according to the age information and failure information; and

predicting future failures for the life cycle of the plurality of components according to the statistical model.

[c35]   35. The computer-readable medium according to claim 34, further comprising instructions for compiling the predicted future failures into a report.

[c36]   36. The computer-readable medium according to claim 35, further comprising instructions for generating the report to the user.

[c37]   37. The computer-readable medium according to claim 34, further comprising instructions for issuing alerts to the user for the predicted future failures.

[c38]   38. The computer-readable medium according to claim 34, further comprising instructions for prompting the user to select additional subsystems and components to analyze.